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Broberg, Morten; Hovani-Bue, Erica

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Disaster Risk Reduction through Risk Pooling: The Case of Hazard Risk Pooling Schemes

*Morten Broberg and Erica Hovani**

1. DISASTER RISK REDUCTION AND RISK POOLING

In March 2015, 187 United Nations (UN) member states adopted the Sendai Framework for Disaster Risk Reduction 2015–2030 (Sendai Framework).[1] The Sendai Framework lays down four specific priorities for action. The third of these four priorities is entitled 'Investing in disaster risk reduction for resilience'. At 'national and local levels' this priority entails, amongst others, '[t]o promote mechanisms for disaster risk transfer and insurance, risk-sharing and retention and financial protection, as appropriate, for both public and private investment in order to reduce the financial impact of disasters on Governments and societies, in urban and rural areas'.[2] At the 'global and regional levels' this priority entails, amongst others, '[t]o promote the development and strengthening of disaster risk transfer and sharing mechanisms and instruments in close cooperation with partners in the international community, business, international financial institutions and other relevant stakeholders'.[3]

It is thus clear that under the Sendai Framework risk transfer, risk sharing, and insurance should be promoted and strengthened at national levels with the support of the international community and other stakeholders. However, the Framework does not say much more than this.

In this chapter we will examine a group of regional multi-country insurance risk pools that have been established in the Global South to address the risks caused by certain hazards such as droughts, hurricanes, tsunamis, and excess rainfall. The rationale underlying an insurance risk pool is that it capitalises on the natural diversification of these hazard risks across a large geographic area, thereby allowing the risk pool member countries to respond to certain but

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[1] United Nations Office for Disaster Risk Reduction (UNISDR), Sendai Framework for Disaster Risk Reduction 2015–2030 (18 March 2015) A/CONF.224/CRP.1. The Sendai Framework replaced UN, Report of the World Conference on Disaster Reduction (Kobe, Hyogo, Japan, 25 18–22 January 2005) A/CONF.206/6, ch. 1, Resolution 2: 'Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters'. The Sendai Framework was endorsed by the UN General Assembly in June 2015. See UNGA, Resolution 69/283 (23 June 2015) A/RES/69/283. Available at www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_69_283.pdf (accessed 23 May 2018).

[2] Sendai Framework, para. 30(b).

[3] Ibid., para. 31(b).

unpredictable risks whilst managing their risk as a group in a financially efficient manner.[4] In this way the member countries can lower the cost of responses to these hazards,[5] they will be better positioned to prevent the disasters from becoming humanitarian crises, and they will be better equipped to service those citizens affected by the disaster.[6]

In what follows, we examine the regulatory framework relating to the existing transnational Global South risk pooling schemes and consider the value of these schemes within the context of disaster risk reduction (DRR). Our examination builds on empirical evidence of existing transnational risk pools such as the Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the African Risk Capacity (ARC), and we will present and analyse the current uses of risk pooling within the context of specific hazards. These risk pools are first of all aimed at weather-related hazards where the on-going climate change presents a particular challenge. For this reason we will use our analysis to identify strengths and weaknesses of using risk pooling in a climate change context.[7]

In terms of our approach, we first provide a brief overview of how climate change impacts may produce hazards and how societies may have to build resilience in order to cope with these hazards (section 2). Thereupon we turn to examine the existing transnational risk pooling schemes aimed at addressing certain hazards in the Global South (section 3). Next, we identify and assess the pros and cons of these risk pooling schemes (section 4). Finally, we sum up our main findings (section 5).

2. CLIMATE CHANGE AS A HAZARD

All reliable data show that the world is presently experiencing climate change – also known as global warming – causing droughts, sea-level rise, more powerful hurricanes, and changed precipitation.[8] The risk pooling schemes we consider here are concerned with hurricanes, droughts, excess rainfall, tsunamis, and earthquakes. With the exception of earthquakes and tsunamis, climate change aggravates these hazards. Thus, the droughts become more frequent and more prolonged,[9] the hurricanes become more powerful,[10] and the precipitation patterns are more likely to change.[11] Indeed, we will argue that climate change has four important characteristics

[4] See in this respect J. Syroka and R. Wilcox, 'Rethinking international disaster aid finance', *Journal of International Affairs*, 59 (2006), 197–214 at 207f.

[5] The African Risk Capacity ARC has observed that 'preliminary findings indicate potential savings of 50% from diversification of drought-related losses across Africa, i.e. a 50 per cent reduction in the contingent funds needed if the risk is pooled among nations and managed as a group rather than borne by each country individually', cf., https://unfccc.int/files/adaptation/application/pdf/consultation_note_eng.pdf (accessed 25 May 2018).

[6] Risk pooling may take many forms. In this chapter we only examine the new Global South, regional multi-country disaster risk pooling schemes. For a presentation of other schemes, see in particular, www.insuresilience.org/ (accessed 27 March 2018).

[7] The Global South risk pooling schemes also play into the UN Sustainable Development Goals (SDGs); in particular SDG 2 (end hunger, achieve food security and improved nutrition, and promote sustainable agriculture) and SDG 13 (take urgent action to combat climate change and its impacts). See UN General Assembly (UNGA), Resolution 70/1, Transforming our world: the 2030 Agenda for Sustainable Development (21 October 2015) A/RES/70/1.

[8] See, for example, Intergovernmental Panel on Climate Change, *Climate Change 2007: Mitigation of Climate Change* (Cambridge University Press, 2007).

[9] A. Dai, 'Drought under global warming: a review', *Wiley Interdisciplinary Reviews: Climate Change*, 2 (2011), 45–65 at 58–59; A. Dai, 'Increasing drought under global warming in observations and models', *Nature Climate Change*, 3 (2013), 52–58 at 52.

[10] T.R. Knutson et al., 'Tropical cyclones and climate change', *Nature Geoscience*, 3 (2010), 157–163.

[11] K.E. Trenberth, 'Changes in precipitation with climate change', *Climate Research*, 47 (2011), 123–138.

that jointly set it apart from most other threats to our societies:

First, from a societal point of view, climate change is a new and significant factor. Thus, according to the National Aeronautics and Space Administration (NASA) (amongst others), Earth's average surface temperature has risen about 1.1 degree Celsius since the late nineteenth century, and most of the warming occurred in the past 35 years, with 16 of the 17 warmest years on record occurring since 2001.[12] Indeed, it has been estimated that today about 75 per cent of the moderate daily hot extremes over land are attributable to global warming.[13]

Second, we view the vast majority of climate change impacts on societies as negative.

Third, we may expect climate change (or global warming) to continue for a long period of time before, ultimately, the Earth's average temperature will stabilise at a new and higher level. In other words, we are moving towards what the World Bank refers to as a 'new climate normal'.[14] This essentially means that at present we are probably facing a continuous increase in both the number and the force of climate change induced impacts that will hit our societies.

Fourth, climate change is so-to-say all-embracing; it affects our societies in multiple, simultaneous ways. Droughts, melting glaciers, altered precipitation patterns, salinisation-intrusion of coastal areas and so on may all adversely affect food production. In addition, more powerful storms and flooding may challenge our infrastructure and supply chains. It also affects settlement patterns as well as the spread of diseases. These several and diverse impacts may occur simultaneously and sometimes reinforce one another. In other words, climate change is likely to produce significant adverse impacts on our societies. Risk pooling is one of the ways of addressing these impacts.[15]

3. RISK POOLING SCHEMES AS A MEANS FOR BUILDING SOCIETAL RESILIENCE TOWARDS NATURAL HAZARDS

3.1. *How Risk Pooling Works*

Risk pooling is the principle underlying insurance. Regional risk pooling is based on the idea that pooling country-specific risks within a regional portfolio generates risk diversification benefits that reduce the aggregate costs of coverage to less than the sum of the individual costs of coverage.[16] It is very unlikely, for example, that all Caribbean islands would be hit by major hurricanes or earthquakes in any given year. Thus, by pooling risks, the World Bank has estimated that countries reduce the cost of individual insurance premiums by nearly half of the cost that would apply if each government were to go to the insurance market on its own.[17]

[12] Not only was 2016 the warmest year on record, but eight of the 12 months that make up the year – from January through September, with the exception of June – were the warmest on record for those respective months, cf. K. Northon, 'NASA, NOAA Data Show 2016 Warmest Year on Record Globally', NASA TV, 18 January 2017. Available at www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally (accessed 23 May 2018).

[13] E.M. Fischer and R. Knutti, 'Anthropogenic contribution to global occurrence of heavy-precipitation and high-temperature extremes', *Nature Climate Change*, 5 (2015), 560–564.

[14] S. Adams et al., *Turn Down the Heat: Confronting the New Climate Normal* (Washington, D.C.: World Bank Group, 2014).

[15] See also World Bank, *Sovereign Climate and Disaster Risk Pooling – World Bank Technical Contribution to the G20* (Washington, D.C.: World Bank, 2017); D. Schoenmaker and G. Zachmann, *Can a Global Climate Risk Pool Help the Most Vulnerable Countries?* (Bruegel, 2015).

[16] World Bank, *Sovereign Climate and Disaster Risk Pooling*, p. 32.

[17] Ibid., p. 44.

However, risk pooling does not reduce risk; it spreads the cost of risk over time and geographic area to lessen its impact.

Pooled regional risks are normally transferred to the international (re)insurance markets, taking advantage of potential financial efficiencies.[18] Developing country weather risks are hereby combined in portfolios of commercial risks held by international reinsurers and hedge funds, which allows the developing countries to benefit from increased diversity and the appetite that the international market has for a greater range of risks.[19] As explained above, by combining and spreading the risks faced by a diverse set of actors, pooling ensures that the total risk of all participants is less than the sum of the individual risk of each participant would be; in other words, 2+2 will only equal 3. However, developing countries do not always have the necessary legal frameworks and financial resources available to take full advantage of risk pooling. Consequently, there is a need for developing national laws and norms necessary to facilitate and regulate sovereign risk pools as well as ensuring that international law is suited to governing sovereign financial transactions of this type.

3.2. *Advantages of Risk Pooling*

Hazards such as hurricanes, droughts, floods, and earthquakes strike all parts of the world, and thus impact societies both in the affluent Global North and in the poorer Global South. However, the welfare impacts from such hazards on societies are generally more adverse in the Global South.[20] Thus, the economic losses relative to economic output are much larger in the Global South and, generally speaking, the economic losses relative to gross domestic product (GDP) are much higher for small countries in the tropics. According to the United Nations Office for Disaster Risk Reduction (UNISDR), economic losses from natural disasters average between USD 250 and 300 billion per year, worldwide.[21] Across 77 of the poorest countries, natural disasters such as hurricanes and severe droughts cost USD 30 billion a year.[22] The impact of these hazards is greater on poor people because they are exposed to hazards more often, lose a bigger share of their wealth when hit (a loss equivalent to USD 100 may be critical to a poor person and insignificant to a wealthy one), and receive less support after a crisis.[23] Indeed, it is estimated that on average every year floods and drought together are responsible for the extreme poverty of about 25 million people, and that if all disasters could be prevented for one year, the number of people in extreme poverty would be immediately reduced by around 26 million worldwide.[24]

Societies in the Global North are more resilient to hazards. This is not only due to the Global North having better infrastructure and institutions, being less exposed than the tropics, and

[18] J.D. Cummins and O. Mahul, *Catastrophe Risk Financing in Developing Countries: Principles for Public Intervention* (Washington, D.C.: World Bank, 2008), p. 4; L. Wolfrom and M. Yokoi-Arai, 'Financial instruments for managing disaster risks related to climate change', *OECD Journal: Financial Market Trends*, 2015/1 (2016), 25–47 at 14.

[19] S. Hochrainer-Stigler, et al., 'Funding public adaptation to climate-related disasters. Estimates for a global fund', *Global Environmental Change*, 25 (2014), 87–96 at 89; Syroka and Wilcox, 'Rethinking International Disaster Aid Finance', at 198.

[20] S. Hallegatte et al., *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters* (Washington, D.C.: International Bank for Reconciliation and Development, The World Bank Group, 2017).

[21] UNISDR, *Global assessment report on disaster risk reduction 2015: Making development sustainable: the future of disaster risk management* (UNISDR, 2015), p. xiv.

[22] A. Whiting, 'Insurance for poor could protect the most disaster-vulnerable-governments', Reuters, 29 July 2017.

[23] Hallegatte et al., *Unbreakable*.

[24] Ibid., p. 75.

having better social protection systems and higher savings. But also to the fact that in the Global North it is common to hedge against the uncertain losses caused by hazards by taking out insurance coverage.[25] Indeed, the UK Department for International Development (DFID) estimates that nearly half the costs of 'natural' hazards are insured in wealthier countries.[26] In contrast, in poorer countries insurance is much less common, with less than five per cent of the cost of natural hazards insured.[27]

Traditionally, governments have borne these losses, with international organisations such as the UN World Food Programme (WFP) often playing the role of de facto insurer of last resort to vulnerable populations in developing countries.[28] International organisations and humanitarian non-governmental organisations (NGOs) essentially seek to address a portfolio of risks that are almost certain to occur; the uncertainty concerns where and at what magnitude. They rely on uncertain funding flows from donors to finance their operations, at a time when donor assistance is struggling to keep up with growing needs. The UN humanitarian appeal for 2017 sought USD 22.6 billion in support for 93.5 million people in 33 countries, up from just USD 7.4 billion in 2011.[29] On average, only about 60 per cent of the humanitarian appeal needs are met, causing significant concern about the international community's ability to reach the world's most vulnerable people in times of crisis, and the humanitarian funds that are available are not equally allocated between emergencies.[30] For example, six months after Haiti was hit by a devastating earthquake in 2010, the country had received less than two per cent of the USD 10 billion that international donors had promised.[31]

Assistance provided by the international community (if any) is normally complemented by national governments reallocating funds in their national budgets from planned development activities to crisis response thereby slowing down the former activities and reducing overall national resilience. In small developing states, for example, the average annual cost of disasters has been found to be 1.8 percent of their GDP.[32] This high cost of disasters, coupled with the cost of response, means that countries have less money to invest in development activities of all types, including, but not limited to developing the resilient infrastructure that would enable them to better withstand future disasters.[33] Without sufficient mitigation, governments suffer from revenue and expenditure volatility that can impact the delivery of public services.[34] This

[25] Even though insurance coverage is common in the Global North, this is not to say that its full potential is exploited. See for example F. Waldenberger, 'Confronting earthquake risk in Japan-are private households underinsured?', *Asia Europe Journal*, 11 (2013), 79–91; H. Kunreuther, 'Disaster mitigation and insurance: Learning from Katrina', *The Annals of the American Academy of Political and Social Science*, 604 (2006) 1, 208–227.

[26] Whiting, 'Insurance for poor could protect the most disaster-vulnerable-governments'.

[27] Ibid.

[28] Syroka and Wilcox, 'Rethinking International Disaster Aid Finance', at 199. Syroka and Wilcox point out that the WFP 'raises aid funds from donors after the disaster – the loss – has occurred'. Thus, in practice donors – together with national governments – will often be the real insurers of last resort.

[29] United Nations Office for the Coordination of Humanitarian Affairs (OCHA), *Global Humanitarian Overview 2017: A Consolidated Appeal to Support People Affected by Disaster and Conflict* (OCHA, 2017); United Nations, *Humanitarian Appeal 2011: Consolidated Appeal Process* (UN, 2011).

[30] R. Chandran and C. Hajaj, 'Time for a Reset: Fixing the Faulty Humanitarian Appeals Process', UNU-CPR Centre for Policy Research (10 November 2015).

[31] United Nations Economic and Social Council, 'Less Than 2 Per cent of Promised Reconstruction Aid for Quake-Devastated Haiti Delivered, Haitian Government Envoy Tells Economic and Social Council', UN Meetings Coverage and Press Releases, 13 July 2010. Available at www.un.org/press/en/2010/ecosoc6441.doc.htm (accessed 24 May 2018).

[32] International Monetary Fund (IMF), 'Small States' Resilience to Natural Disasters and Climate Change- the Role for the IMF', IMF Policy paper (7 November 2016), p. 11. Available at www.imf.org/external/np/pp/eng/2016/110416.pdf (accessed 17 December 2018).

[33] Ibid., p. 24.

[34] F. Ghesquiere and O. Mahul, 'Building Financial Resilience Against Natural Disasters and Climate Change', Commonwealth Finance Ministers Report 2012, World Bank (2012), p. 2.

is particularly problematic in low- and middle-income countries where rapid urbanisation combined with insufficient territorial planning and lack of safe building standards may result in exponential growth in assets exposed to threat of damage.[35] Countries may also rely on loans, increasing their national debt. Whatever costs are not borne by the government or the international community are necessarily passed on to the people directly affected by the hazard.[36]

Risk pooling is intended to move the cost of disaster response away from the traditional, ad hoc method of dealing with disasters, and instead make funding flows following disasters predictable for governments and vulnerable populations. It also shifts actual expenditures from ex post to ex ante, allowing the costs of disasters to be spread over a number of years at a predictable rate rather than requiring a country to reallocate its budget to respond to a crisis when it occurs – something that is not possible to predict. Risk pools can protect development and resilience gains by providing predictable funding, and this 'thinking ahead' improves the quality of the support governments may choose to give to those parts of their population that are affected by a disaster. The predictability is also good for sovereign disaster risk financing strategies. In addition, by providing funding very quickly after the disaster has struck, the risk pools prevent households from engaging in negative coping mechanisms. For example, in Kenya an analysis found that early response in grassland areas could reduce the cost of food aid by 50 per cent and the value of animal losses by 25 per cent, or more, depending on the intervention used.[37] Moreover, where a country is only eligible to participate in a risk pool if it engages in contingency, this necessarily means that the risk pooling also encourages hazard risk planning at the national level.

Arguably, one of the attractions of a risk pooling scheme is that it puts a price tag on hazards. Historically, countries and international organisations have made little effort to quantify the costs or benefits of retaining risk at the national level. Risk reduction activities are typically undertaken using funds from national budgets, whereas the cost of responding to disasters to a considerable degree has been borne by the international community. This made it difficult for countries to internalise the value of risk reduction or the full costs of retaining the risks from hazards. Putting a price to the cost of hazards allows countries to make informed decisions regarding climate adaptation, disaster risk reduction expenditures, and contingency plans in an objective way, based on transparently monetised disaster risk. For example, if a country knows that its cost of response to a drought in an area would be USD 30 million, and the cost of distributing drought-resistant seed to the same area is USD 10 million it has an objective way to make decisions. This may be contrasted to classic donor-led disaster responses which generally bypass the national treasury, meaning that it does not allow for an objective assessment within the affected countries' administrations of the cost of disaster response versus other ways of addressing disasters.

3.3. *The Creation of Multinational Global South Risk Pooling Schemes*

The relevance of insurance coverage against hazards was clearly illustrated when Hurricane Ivan hit the Caribbean islands in 2004. The devastating hurricane caused more than USD

[35] Ibid., pp. 1–2.

[36] Food and Agriculture Organization of the United Nations (FAO), *The impact of natural hazards and disasters on agriculture and food security and nutrition: a call for action to build resilient livelihoods* (Rome: FAO, 2015); C.A. Harvey, et al., 'Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar', *Philosophical Transactions of the Royal Society B: Biological Sciences*, 369 (2014).

[37] C.C. Venton et al., 'The Economics of early response and disaster resilience: Lessons from Kenya and Ethiopia', Economic Resilience Final Report (2012).

18 billion in total damage across a swath of the island countries.[38] The small island nation of Grenada, for example, suffered damages equal to twice its gross domestic product.[39] In response, the Caribbean Community (CARICOM) Heads of Government approached the World Bank to help them establish the Caribbean Catastrophe Risk Insurance Facility (CCRIF) (now, CCRIF SPC), the world's first multi-country, sovereign risk pool.[40] CCRIF was established as a regional catastrophe fund intended to provide funding to Caribbean governments in case of a hurricane or earthquake, and in particular to help mitigate the short-term cash flow problems suffered by those governments.[41] It began offering insurance coverage for hurricanes and earthquakes to Caribbean governments in 2007, and providing insurance against excess rainfall in 2013. In 2014, CCRIF expanded its coverage into Central America and changed its corporate form to that of a 'special purpose company' (SPC). As of 2017, CCRIF was providing insurance to 17 countries in Latin America and the Caribbean. CCRIF has paid out approximately USD 130 million[42] since its inception, including approximately USD 61.5 million during the 2017 Atlantic Hurricane season (as of 30 October 2017).[43]

An important argument behind the creation of the CCRIF was that ex post disaster funding from international aid agencies fails to address the critical need for short-term liquidity, simply because it takes too long from when the disaster strikes and until the emergency assistance from the aid agencies begins flowing into the countries that had been hit. However, such liquidity is necessary to maintain essential government services until additional resources become available. This challenge is met by the CCRIF since it provides liquidity quickly, by using predefined parametric triggers, as explained in section 3.4.2.

Following the creation of CCRIF other multi-country parametric risk pools have seen the light of day, namely the Pacific Catastrophe Risk Insurance Pilot that is an integral part of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)[44] and the ARC.[45] Whereas the former is rather similar to CCRIF, ARC differs on important points. In what follows

[38] E.S. Blake, C.W. Landsea, and E.J. Gibney, 'NOAA Technical Memorandum NWS NHC-6' (2011), at 9; 'Counting the cost', The Economist, 16 September 2004.

[39] Organisation of Eastern Caribbean States (OESC), *Grenada: macro-socio-economic assessment of the damages caused by Hurricane Ivan, September 7 2004* (St Lucia: OECS, 2004), p. 72.

[40] Prior to the creation of the CCRIF some single-country risk pools had been established in the Global South. For example, the Mexican Natural Disaster Fund (FONDEN) was created in 1996 and in 2000 the Turkish Catastrophe Insurance Pool (TCIP) established a compulsory earthquake insurance scheme in Turkey. Regarding these two schemes, see further The World Bank, *FONDEN Mexico's Natural Disaster Fund – A Review* (Washington, D.C.: World Bank, 2012); E. Gurenko, *Earthquake Insurance in Turkey: History of the Turkish Catastrophe Insurance Pool* (Washington, D.C.: World Bank, 2006); Dask – Turkish Natural Catastrophe Insurance Pool, 'Earthquake will pass and the life will go on'. Available at www.tcip.gov.tr/hakkinda.html (accessed 27 March 2018).

[41] For the background to the CCRIF, see M. Bennett and S. Smyth, 'How Capital Markets Can Help Developing Countries Manage Climate Risk', *Boston College Environmental Affairs Law Review*, 43 (2016), 251–280; CCRI SPC, 'FAQ'. Available at www.ccrif.org/faq-questions-inline (accessed 24 May 2018).

[42] CCRIF SPC, *CCRIF SPC Annual Report 2016–2017* (Cayman Islands: CCRIF SPC, 2017), pp. 7–8.

[43] Ibid., p. 8.

[44] Sometimes the risk insurance component of the PCRAFI is referred to as the 'PCRAFI Pilot'.

[45] At the time of writing, several actors including CCRIF and the World Bank are also working on the establishment of a parametric risk pooling scheme as part of the promotion of food security and climate resilience in the Caribbean fisheries sector; the Caribbean Ocean Assets Sustainability Facility (COAST) (sometimes the abbreviation is said to mean Caribbean Oceans and Aquaculture Sustainability Facility). See further UNISDR, 'Caribbean Oceans and Aquaculture Sustainability Facility (COAST)', UNISDR (2017), available at www.unisdr.org/files/globalplatform/593091226 8d82COAST_one-page_handout_final.pdf; J. Duncan, 'Promoting Food Security and Climate Resilience in the Caribbean', United States Department of State – Official Blog, 9 October 2015. Available at 2007-2017-blogs.state.gov/stories/2015/10/09/promoting-food-security-and-climate-resilience-caribbean.html (accessed 24 May 2018).

there will be situations where we will therefore have to distinguish between CCRIF (together with PCRAFI) and ARC.

3.4. *The Workings of Global South Parametric Risk Pooling Schemes*

3.4.1. *Background to the Risk Pooling Schemes*

All the risk pools that we consider in this chapter pre-define one or more specific hazard occurrences. With respect to these occurrences, the participating countries only pay for their own risk, but when re-insuring these risks the risk pools take on the total risk profile of the group of countries that together form the pool rather than the risk profile of each of these countries individually. The pools hereby combine the uncertainty of individual risks into a calculable risk for the covered group of countries as a whole. For example, the ARC scheme addresses certain droughts and it combines the risk of such droughts occurring across the countries that are members of ARC to take advantage of the natural diversity of these countries. The underlying premise is that it is unlikely that droughts will occur in the same year in all countries covered by the scheme. Therefore, the exposure of the ARC to co-variant drought risk is significantly smaller than the exposure a member country of the ARC would be subject to if this country would have to shoulder the risk alone. This, in turn, means that the ARC can manage drought risks with fewer funds than if each of the member countries would have to cover the risk individually.

At the time of writing (2018) the number of multi-country parametric Global South risk pooling schemes addressing the risks caused by hazards is limited to only three. The CCRIF, the first of the schemes to come into existence, was only formed as recently as in 2007 by 16 Caribbean countries, with CARICOM as a key actor.[46] The World Bank took on a leading role with regards to the technical development of the scheme,[47] and its capitalisation was financed through contributions to a multi-donor trust fund where funding from the World Bank was complemented by contributions from the Caribbean Development Bank and a limited number of other donors.[48] Subsequently, PCRAFI was initiated upon the request of the Pacific Island Countries (PICs) with the Pacific Islands Forum Secretariat following the workings of the scheme. As with the CCRIF, the World Bank played an important role in establishing the PCRAFI, and just like the CCRIF the establishment of this younger scheme is also to a considerable extent financed by traditional donors of development assistance.[49] ARC was developed as a joint project between the African Union (AU) and the WFP. It became a specialised agency

[46] Most of CCRIF's functions are performed by independent contractors and CCRIF itself therefore has only two full-time staff members, cf. CCRIF SPC, 'Executive Management'. Available at www.ccrif.org/content/aboutus/executive-management (accessed 24 May 2018); CCRIF SPC, 'The CCRIF Team'. Available at www.ccrif.org/content/aboutus/ccrif-team (accessed 24 May 2018).

[47] The World Bank, *Implementation Completion and Results Report on a Grant to the Caribbean Catastrophe Risk Insurance Facility for a Caribbean Catastrophe Risk Insurance Project* (2012) p. 8. Available at http://documents.worldbank.org/curated/en/733451468225588956/pdf/ICR23320P108050odisclosure070270120.pdf (accessed 25 May 2018).

[48] Ibid., Table 2 at p. 7.

[49] The World Bank, 'Implementation Completion and Results Report on a Grant to the Pacific Islands for a Pacific Catastrophe Risk Insurance Pilot Program', Report No. ICR00003696 (Sydney: 2016); UNISDR, 'Caribbean Oceans and Aquaculture Sustainability Facility (COAST)'. In 2015, in Phase II of the PCRAFI project, the PCRAFI Facility was established as a foundation in the Cook Islands to enable a handover of PCRAFI's work from the World Bank to a separate facility. The governance structures of the PCRAFI Facility were developed in consultation with a Technical Working Group comprising secretaries of finance of participating Pacific Island Countries.

of the African Union in 2012 and in 2018 counts 33 AU countries as members.[50] ARC receives grant funding from donors for its operational costs and administrative support from WFP. The ARC insurance scheme is capitalised by interest-free loans from donors rather than by grants.[51]

In the case of all three schemes, the affected countries together with regional organisations like the AU have played key roles in their establishment, and have turned to international organisations (World Bank and WFP, respectively) for assistance. And in all three cases premiums and participation fees are, at least principally, paid by the member countries.

3.4.2. *Risks Covered by the Global South Risk Pooling Schemes; Calculating Payments*

The risk pooling schemes we examine here concern the negative impact on societies caused by certain hazards; namely droughts (ARC), hurricanes (CCRIF, PCRAFI), earthquakes (CCRIF, PCRAFI), tsunamis (PCRAFI), and excess rainfall (CCRIF).[52]

The Global South risk pooling schemes are based upon so-called parametric insurance; they differ from traditional household insurance schemes in that pay-outs are triggered by a predefined event rather than based on an assessment of the actual post-event losses. Thus, under parametric insurance policies when entering into the insurance event the parties to the insurance agreement define those events which shall trigger the right to payment as well as the size of these payments; for example, a hurricane of a certain magnitude hitting certain predetermined cities. These predefined events (for example, hurricanes) are correlated to a parameter or to an index of parameters (in our example: magnitude and cities hit). The use of parametric insurance means that when an insurance event occurs, it will be reasonably straightforward and fast to establish whether a payment must be made under the insurance scheme as well as the size of such payment. There is no delay to evaluate actual losses to make a pay-out. This means that the countries that are hit very quickly receive funding that allows them to address the challenges; and speed will often be of the essence in the aftermath of this type of disasters.[53] Even though pay-outs are not based on an assessment of post-disaster losses, the schemes base the pay-outs upon 'modelled losses' (CCRIF and PCRAFI) or 'modelled response costs' (ARC); meaning that the coverage is modelled against expected consequences ('losses' or 'response costs') of a specific hazard event. In other words, the speed provided by parametric insurance comes at a cost; namely that pay-outs may not match actual losses/response costs.

[50] ARC consists of two entities: the African Risk Capacity Specialized Agency of the African Union (ARC Agency); an international organisation. And the African Risk Capacity Insurance Company Ltd (ARC Ltd); an independent insurance company organized under the laws of Bermuda. ARC Agency assists countries with capacity building, contingency planning and other support. ARC Ltd handles ARC's risk pooling and transfer activities, including providing parametric insurance coverage for member countries against extreme weather events. This structure is similar to that of PCRAFI, which comprises a foundation and an insurance company, but different from CCRIF.

[51] The German Development Bank, KfW, and DFID committed to provide ARC Ltd, the insurance affiliate of ARC, interest-free loans that must only be repaid after 20 years. The premiums paid by the African governments that take out insurance from ARC include a percentage of funding that is intended to repay the loans in the future. See further Oxford Policy Management, *Independent Evaluation of the African Risk Capacity (ARC): Formative Phase 1 Report* (Oxford: Oxford Policy Management, Itad, 2017) p. 47.

[52] These hazards were selected based on a combination of their impact on the member countries of the respective risk pools, and country demand. ARC presently covers droughts. In the future they expect to also cover other hazards, including floods, excess rainfall, tropical cyclones and outbreaks and epidemics of human disease, cf. ARC, 'How ARC works'. Available at www.africanriskcapacity.org/2016/10/29/how-arc-works/ (accessed 24 May 2018).

[53] Under the CCRIF all pay-outs (by March 2015) 'were transferred to the respective governments within 14 days (and in some cases within a week) after the event' cf. 'About CCRIF – Flyer March 2015' (2015), available at www.ccrif.org/sites/default/files/publications/About_CCRIF_Flyer_March_23_2015_0.pdf (accessed 25 May 2018). Similarly, ARC is able to provide pay-outs to the countries affected by droughts within 2–4 weeks of harvest. This means that the first assistance will reach the affected households within four months. See further ARC, 'How ARC works'.

That parametric insurance is not without its problems became clear when Malawi experienced drought in 2016. The Malawian government estimated that 6.5 million people required food assistance whereas ARC's parametric model initially indicated that only approximately 20,000 people were affected. ARC undertook field research and discovered that farmers had switched to growing a different type of crop than that assumed in the model. ARC re-customised its software to correct this, resulting in a model outcome providing a better representation of the situation on the ground and an insurance pay-out to the government.[54] The NGO ActionAid examined what had happened – and concluded that rather than promoting the expansion of climate risk insurance markets for the poor and vulnerable, it was necessary to 'pause and reconsider this quest'.[55] They therefore recommended turning to other measures than risk pooling; for example, that Malawi should make its social protection system more integrated, scalable, adaptive, and universal, that the country should support more climate-resilient, sustainable agriculture, and that it should ensure more irrigation, adequately resourcing decentralised DRR and enhancing the network of weather stations. Or that it should save at least some of the money each year in a contingency fund for disasters. However, we believe that the Malawi case, first of all, illustrates the importance of carefully designing and continuously improving both the insurance policies and the parametric system as such.[56]

ARC, CCRIF, and PCRAFI are intended to cover infrequent, devastating events where we do not have prior knowledge about when and where they will occur next time or how hard they will strike.[57] Still, to a fair extent we are able to make predictions about their frequency and magnitude based on historical data. This means that the coverage provided by each scheme is calculated so that the policies are triggered only in situations in which, before the disaster strikes, it is considered very likely that the countries will suffer a significant loss/response costs. For example, in 2013 the Solomon Islands suffered a magnitude 8.0 earthquake. The earthquake caused losses on the islands, but since the losses were suffered far from the economic centre of the Solomon Islands there was only limited impact on core government services, the country's economy, and the country's future economic development. Under the country's PCRAFI insurance policy the earthquake was required to have a certain seismic impact in the economic centre in order to trigger pay-out, and since the threshold was not reached, the earthquake did not trigger payment under the PCRAFI insurance scheme.[58]

[54] Press Release – Malawi to Receive USD 8M Insurance Payout to Support Drought-Affected Families', ARC, 14 November 2016. Available at www.africanriskcapacity.org/2016/11/14/press-release-malawi-to-receive-usd-8m-insurance-payout-to-support-drought-affected-families/ (accessed 24 May 2018).

[55] J. Reeves, *The Wrong Model for Resilience: How G7-Backed Drought Insurance FAILED MALAWI, and What We Must Learn From It* (Johannesburg, South Africa: ActionAid International Secretariat, 2017) p. 3.

[56] See similarly ARC Agency, and Oxford Policy Management, *Building climate and disaster resilience in Africa: Lessons from the African Risk Capacity (ARC)* (Oxford: Oxford Policy Management, 2018), p. 3., who observe that it is necessary to customise the risk modelling software's parameters to accurately reflect a member country's risk profile; and that it can take years and regular updating to identify and integrate the correct data sets for a refined country customisation.

[57] CCRIF now offers coverage down to five-year return periods. From a financing point of view this may not be an efficient choice since this essentially means that there will be more insurance events, and as consequence there will be more pay-outs and thus higher insurance costs. However, from a political point of view it is a popular choice. With regards to ARC, D. J. Clarke and R. V. Hill, 'Cost-benefit analysis of the African risk capacity facility', WFP, AU Commission (2012), p. 48 observe that 'ARC should consider not making claim payments to any country more frequently than once every five years, on average'. And these two authors also note that '[r]educing the claim payment frequency to once every eight or 10 years on average, and increasing the level of coverage for those extreme years, would be better still from a welfare perspective'.

[58] The World Bank, *Pacific Catastrophe Risk Insurance Pilot Report: From Design to Implementation – Some Lessons Learned* (Washington, D.C.: The World Bank, 2015) p. 34.

Being based upon parametric insurance, all the Global South risk pooling schemes require an unambiguous and independent determination of whether the predefined parameters have been met. The schemes rely on underlying catastrophe risk models based on robust datasets provided by internationally recognised bodies such as the United States Geological Survey in the case of earthquakes covered by the CCRIF. In addition, the parties will designate an independent third party to calculate the pay-out.[59]

All three risk pooling schemes provide coverage tailored to the individual member country. Thus, the member countries may select the level at which they wish to participate in the scheme by selecting the amount of risk they wish to retain and the pay-out they want where the policy is triggered. In other words, the member countries may opt for a premium that suits their finances by choosing a less generous coverage.[60] The tailoring of each member country's policy[61] means that the countries must decide on the coverage that they wish to obtain, based on three parameters: (i) 'the attachment point', which means the severity of the event that gives rise to a payment, measured by statistical likelihood of occurrence, in years; (ii) 'the exhaustion point', which refers to the severity of the event loss at or above which the maximum payment is triggered;[62] and (iii) 'the dollar amount of the maximum pay-out'. Each of these three factors has an impact on the premium paid so member countries need to balance the features of their policy with the budget available to pay the premium.

Moreover, the risk pooling schemes are not intended to cover all of the losses following an extreme weather event, but rather they are primarily intended to speedily provide first-response relief. However, this first-response relief still must be followed up by traditional (slower) relief such as loans and humanitarian relief. In other words, the purpose of the risk pooling schemes is to fill the void that otherwise exists between the time when the disaster strikes and the time when traditional assistance arrives, as is illustrated by Figure 13.1.

As will be clear, the funds provided by the multi-country parametric risk pools currently operating in the Global South are intended to provide short-term financial liquidity via a quick infusion of cash that allows the government to begin to respond immediately to the needs of the impacted populations. Countries in the Global South may lack the financial resources to purchase insurance that would cover the full costs of response to a disaster; they may also lack the capacity to implement a response of the magnitude required. Thus, while risk pooling may be a useful tool to help vulnerable societies to respond to climate change manifestations, it should not be viewed as a stand-alone solution.

3.4.3. *Enhancing Disaster Risk Management Capacity as Part of Joining the Risk Pooling Schemes*

In order to fully understand the workings of the Global South risk pooling schemes, it is important to make clear that their objective is to help the member countries of the different

[59] How these calculations are carried out is laid down in the policies that have been underwritten.

[60] In 2014 Solomon Islands withdrew from the PCRAFI due to dissatisfaction with the coverage of the scheme, cf. The World Bank, *Pacific Catastrophe Risk Insurance Pilot Report*, p. 17.

[61] Or 'policies'. For example Trinidad and Tobago has negotiated two parallel policies regarding excess rainfall; one covering the island of Trinidad and the other covering the island of Tobago, cf. 'CCRIF to Make 1st Payout to Trinidad & Tobago after October Rains', CCRF SPC, 30 October 2017. Available at www.ccrif.org/news/ccrif-make-1st-payout-trinidad-tobago-after-october-rains (accessed 24 May 2018).

[62] In other words, the policy only covers losses up to a pre-specified limit. For example, in the 2009–2010 policy year CCRIF member countries selected exhaustion points equivalent to between 1-in-75 and 1–in-200 year events, cf. CCRIF SPC, 'Understanding CCRIF's Hurricane and Earthquake Policies', *Technical Paper series no. 1* (2012), 1–8 at 6.

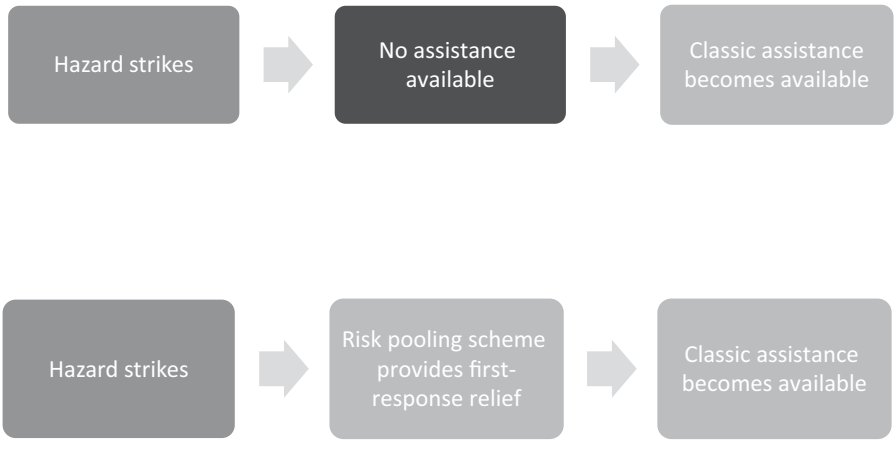

Figure 13.1 Purpose of Risk Pooling Schemes

risk pools build resilience against particularly adverse hazards – and whilst providing insurance coverage is the main objective, the risk pools also help the member countries in other ways. Both CCRIF and PCRAFI, for example, have technical assistance programs intended to enhance the capacity for disaster risk management in their member countries.[63] CCRIF's technical assistance program has three components: (i) scholarships and professional development; (ii) regional knowledge building; and (iii) support for local disaster risk reduction initiatives.[64] The program is intended to strengthen the capacity of both institutions and individuals to respond to hazards in the Caribbean. Still, under the CCRIF the member countries are not required to draw up contingency plans to enter the scheme, and there are no restrictions on how they may use the pay-outs (contrast with ARC below).

PCRAFI's technical assistance program includes both regional and national capacity building work streams, as well as support to build technical collaboration, including with CCRIF and ARC.[65] PCRAFI's national government technical assistance program is intended to help member countries incorporate contingency plans into existing national frameworks and build capacity in post-disaster public financial management. Although contingency planning is one of PCRAFI's six key principles,[66] countries are not currently required to develop a contingency plan before taking out insurance; nor are they required to provide information on how the funds are spent once received.[67] An undated description of PCRAFI produced by the World Bank refers to the development of contingency plans by countries, as

[63] In addition to providing insurance, CCRIF works with partner organisations such as the Caribbean Institute for Meteorology and Hydrology (CIMH) and the Caribbean Disaster and Emergency Management Agency (CDEMA) to provide data and other technical assistance for better planning for, response to, and recovery from natural catastrophes.

[64] CCRIF SPC, *CCRIF SPC Annual Report 2016–2017*, pp. 41–55.

[65] The World Bank, 'PCRAFI Facility: Phase II – Enhancing the financial resilience of Pacific Island Countries against natural disaster and climate risk', p. 3. Available at pubdocs.worldbank.org/en/178911475802966585/PCRAFI-4-pager-web.pdf (accessed 24 May 2018).

[66] The six principles are: country ownership, financial sustainability, contingency planning, accountability and transparency, comprehensive disaster risk financing strategy, and link with disaster management agenda, cf. The World Bank, 'PCRAFI Facility: Phase II – Enhancing the financial resilience of Pacific Island Countries against natural disaster and climate risk', p. 1.

[67] Ibid., p. 1.

well as ex post financial reporting procedures to monitor the use of pay-outs as 'next steps' to be taken in the development of PCRAFI.[68]

ARC differs from both CCRIF and PCRAFI. Thus, an ARC member country must sign a memorandum of understanding for domestic capacity building,[69] it must define a contingency plan for ARC pay-outs, and it must determine risk transfer parameters.[70] When an ARC insurance policy is triggered, the pay-out must be spent in conformity with the member country's contingency plan. By putting in place such contingency plans already when the insurance contract is entered into, the member countries will be able to act very quickly after the hazard has struck. Contingency plans are specific to the insured hazard because the appropriate disaster responses are often different for different types of hazards. For example, while distributing food and animal fodder are typical disaster response activities in a drought situation, flood emergencies may call for building emergency shelters and disease prevention activities. ARC contingency plans are developed in accordance with ARC's Contingency Planning Standards and Guidelines which lay out standardised criteria for contingency plans across countries.[71]

The development of detailed contingency plans is viewed as very important since a swift response is often essential in the aftermath of disasters.[72] ARC considers that one of its primary objectives is to ensure that early response activities reach those most impacted by extreme weather events in Africa. The member countries are therefore required to identify the optimal use of any ARC pay-out given the existing national risk management structures and the needs of potential beneficiaries,[73] and member country governments are encouraged to harmonise their ARC contingency plans with other national contingency plans.[74] Unfortunately, there is limited coordination between ARC and other entities, such as the World Bank or bilateral donors, that also encourage contingency planning in ARC member countries. International organisations and donors have made some attempts to coordinate their contingency planning work with member governments, but until now only with limited success.

4. EVALUATING THE GLOBAL SOUTH RISK POOLING SCHEMES

4.1. *Global South Risk Pooling in the Context of International Agreements*

As observed in section 1, the Global South risk pooling schemes examined in this chapter fall squarely within the Sendai Framework, and in particular within the third of the Framework's four priorities which concerns investing in disaster risk reduction for resilience. Thus, according

[68] Ibid., p. 4.
[69] The capacity building programme covers early warning, risk modelling, contingency planning, disaster risk management, and risk financing. Capacity building to a considerable extent is about training key actors (typically civil servants). It is therefore important that the turnover of staff is not too high. This is a real challenge, however, as pointed out in ARC Agency, and Oxford Policy Management, *Building climate and disaster resilience in Africa*, p. 3.
[70] ARC, 'ARC Criteria for Granting Good Standing', ARC/LW3/D004.1209_16. Available at www.africanriskcapacity.org/wp-content/uploads/2017/03/ARC_Criteria-for-Granting-CGS_EN_20160912_v04.pdf (accessed 24 May 2018).
[71] See further AU, Agreement for the Establishment of the African Risk Capacity (ARC) Agency, Pretoria, 23 November 2012, not yet in force but applied provisionally, art. 13(2(h)), and (l), and; ARC, 'Contingency Planning Standards and Guidelines'. Available at www.africanriskcapacity.org/2016/12/05/standards-and-guidelines/ (accessed 24 May 2018).
[72] IMF, *Small States' Resilience to Natural Disasters and Climate Change – Role for the IMF*, IMF Policy Paper (Washington, D.C.: IMF, 2016) p. 32.
[73] ARC, 'ARC Criteria for Granting Good Standing'; ARC, 'Contingency Planning'. Available at www.africanriskcapacity.org/2016/10/31/contingency-planning/ (accessed 24 May 2018).
[74] ARC, 'ARC Criteria for Granting Good Standing'; ARC, 'Contingency Planning – African Risk Capacity'.

to the Sendai Framework, risk transfer, risk sharing, and insurance should be promoted and strengthened at national levels with the support of the international community and other stakeholders.

The Sendai Framework is not the only international agreement promoting the establishment of Global South risk pooling schemes addressing disasters, however. Thus, over the last decade risk pooling and financial protection from climate change have gained increasing attention on the global agenda. In particular, article 8 of the 2015 Paris Agreement[75] states that the parties to the agreement 'recognize the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage' and the provision specifically calls upon the parties to cooperate on 'risk insurance facilities, climate risk pooling and other insurance solutions'.[76] In addition, the Executive Committee of the Warsaw International Mechanism for Loss and Damage[77] launched a clearing house for information on risk transfer and insurance aimed at helping 'Parties to develop and implement comprehensive risk management', coinciding with the 2017 United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP).[78]

Moreover, in 2015, in response to the Sendai Framework, the G7 adopted the InsuResilience Initiative led by the German government, with the goal of increasing 'access to direct or indirect insurance coverage against the impacts of climate change for up to 400 million of the most vulnerable people in developing countries by 2020'.[79] The objective of InsuResilience is to cover 180 million people through the scaling up of the African, Pacific and Caribbean risk pools, and through KfW Development Bank's Climate Insurance Fund. The German government launched the InsuResilience Global Partnership in 2017, at the UN climate summit (COP23) in Bonn, with the intention that it would serve as a multi-stakeholder community to ensure coordinated global action and increase access to knowledge regarding climate change.[80] It is however not clear what the InsuResilience Global Partnership will contribute that goes beyond what the existing risk pools and the World Bank are already providing.

[75] The Sendai Framework was signed by 187 UN member states in March 2015. Paris Agreement, Paris, 12 December 2015, in force 4 November 2016, C.63.2016.

[76] Paris Agreement, art. 8(f).

[77] Established at the 2013 Warsaw Climate Change Conference (COP19) under the UNFCCC, cf. UNFCCC, 'Warsaw International Mechanism for Loss and Damage'. Available at unfccc.int/adaptation/workstreams/loss_and_damage/items/8134.php (accessed 24 May 2018).

[78] In recital 49 of the Paris Agreement the COP requested 'the Executive Committee of the Warsaw International Mechanism to establish a clearinghouse for risk transfer that serves as a repository for information on insurance and risk transfer, in order to facilitate the efforts of Parties to develop and implement comprehensive risk management strategies'. See further United Nations Climate Change Secretariat, 'Paris Agreement Progress Tracker – Work programme resulting from the relevant requests contained in decision 1/CP.21' (2018). Available at unfccc.int/files/paris_agreement/application/pdf/pa_progress_tracker_200617.pdf (accessed 24 May 2018). See also UNFCCC, 'Home: Clearing House for Risk Transfer'. Available at unfccc-clearinghouse.org/ (accessed 24 May 2018).

[79] 'G7 Climate Risk Insurance Initiative – Stepping Up Protection for the Most Vulnerable', UNFCCC News, 8 October 2015. Available at unfccc.int/news/g7-climate-risk-insurance-initiative-stepping-up-protection-for-the-most-vulnerable (accessed 24 May 2018).

[80] InsuResilience Global Partnership, 'Consultation Draft: Concept Note – Shaping the InsuResilience Global Partnership' (2017), p. 7. Available at www.insuresilience.org/wp-content/uploads/2017/12/Consultation-Draft-Concept-Note-InsuResilience-Global-Partnership-Nov-3.pdf (accessed 24 May 2018); InsuResilience Global Partnership, 'Joint Statement InsuResilience Global Partnership', UNFCCC COP 23 (Bonn: 2017).

4.2. *Economic Aspects of Transnational Parametric Risk Insurance Pooling*

The most obvious advantage of the Global South risk pooling schemes arguably is the fact that by shouldering the risk together the member countries as a whole become less vulnerable to the onslaught from hazards. There are three aspects to this. First, the risk pooling cushions the most devastating strokes to the member countries' societies.[81] Second, since the schemes are based on parametric insurance the member countries receive financial infusion immediately after the disaster has struck, thereby allowing them to act very quickly when addressing the challenges. Third, the member countries obtain significant economic savings by joining forces in a collective risk pool.[82] For example, ARC has estimated that 'by collectively pooling and diversifying their risks across the continent, countries save up to 50% in the cost of emergency contingency funds'.[83] To complete this picture, ARC also observes that an

> analysis by the Boston Consulting Group shows the potential benefit of ARC outweighs the estimated cost of running ARC by 4.4 times compared to traditional emergency appeals for assistance, as a result of reduced response times and risk pooling. This means one dollar spent on early intervention through ARC saves four and a half dollars spent after a crisis is allowed to evolve.[84]

Participating in a risk pool in other words allows the member countries to focus their efforts on development – and to maintain this focus even in the face of major disasters.

The Global South risk pooling schemes also have the potential to play an important role for investors since they provide the member countries with immediate financing, which in principle could enable the countries to re-establish critical infrastructure such as electricity.[85] This however presupposes that the pay-outs are large enough to re-establish the critical infrastructure – which is far from always the case. Still, the Global South risk pooling schemes have the potential to minimise the risk of investors – and thereby promote long-term investments (and thus development).

4.3. *Risk Pools as a Catalyst for Societal Adaptation to Hazards*

The economic aspects of setting up a joint risk pool are not the only advantage that a member country derives from the schemes since they do not just provide insurance coverage. Rather, to differing extents the schemes take a more holistic approach to creating resilience against hazards. All three risk pools attempt to do this through education and partnerships but also, in the case of ARC (and PCRAFI in the future), through the use of contingency plans. Thus, ARC requires member countries to set up elaborate contingency plans before they are allowed to take out insurance. In other words, that the schemes are about 'infusing resilience' into the affected societies and not only about compensating losses is key to understanding their real value for the member countries.

[81] As we have seen in section 3.4.2, the risk pooling schemes have been created to cover solely the most significant hazards that only occur on an infrequent basis – and the schemes are not intended to cover the total losses incurred, but merely to provide immediate relief.

[82] See, for example, F. Ghesquiere and O. Mahul, 'Caribbean Catastrophe Risk Insurance Facility (CCRIF): Disaster Risk Financing & Insurance Case Study', World Bank Group (2012).

[83] Cf. M. Beavogui, 'Case study: The African Risk Capacity (ARC) and Talking Points', ARC, Background Sheet 2 (2016); ARC, 'How ARC works'.

[84] ARC, 'How ARC works'; 'The Cost of Drought in Africa', ARC Secretariat (2016), p. 3.

[85] This does not include ARC because ARC funds cannot be used on infrastructure projects.

The predictable nature of an insurance pay-out from a sovereign risk pool enables countries to plan their disaster responses in a way that is not possible when disaster response funds are obtained on an ad hoc basis. Moreover, by calculating pay-outs on the basis of parametric triggers, they are generally much more predictable and transparent than is humanitarian funding. Indeed, humanitarian funding cannot be predicted in advance, and very often such funding does not go through the governments' systems, so the government of the disaster-stricken country cannot take control over its own disaster response, and may not even have insight into the amount of disaster funding it is receiving.

Moreover, the risk pooling schemes enable the affected societies to react very swiftly after the disaster has struck. The general view seems to be that an early intervention in combination with efficient contingency planning is significantly more cost-efficient than a slow intervention.[86] One reason being that an early intervention will act as a safety-net which prevents those affected by the disaster from engaging in costly risk-coping mechanisms such as being forced to dispose of productive assets (for example, consuming seed grain and slaughtering livestock) to keep alive.[87] Such risk-coping mechanisms will very likely have long-term adverse effects and cause development backsliding. A speedy pay-out from a risk pooling scheme is not in itself sufficient to provide substantial benefits *vis-à-vis* more traditional (and slower) interventions, however. Thus, in a 2013 cost-benefit analysis of ARC, Daniel J. Clarke and Ruth Vargas Hill found that there are potential speed benefits from an early pay-out from ARC, as speeding up the disbursement of aid reduces the economic losses households face. However, they simultaneously identified a number of conditions that must be met for these benefits to materialise.[88] First of all, the two authors pointed out that effective contingency plans are essential since without an appropriate distribution system the assistance may not reach vulnerable populations in a timely manner; even if ARC is able to make an early pay-out.[89]

The above discussion regarding the benefits of early intervention after the disaster has struck is based on economic considerations only. Early intervention arguably also carries important – albeit much less tangible – benefits in limiting human suffering that may accompany a slow intervention.

One aspect of the Global South risk pooling schemes, which seems to have attracted only limited attention, is the fact that the policies in reality put a 'value tag' on different geographic parts of societies. For example, if an ARC member country wishes to take out insurance cover against drought in a specific location and it turns out that the likelihood of a severe drought (that will trigger a pay-out under the policy) is substantial, the premium may turn out to be prohibitively high. However, this will be a strong indication that the risk of a devastating disaster is so substantial that it may reasonably be questioned whether, from an economic point of view, the societies in these locations are sustainable. This could likely constitute a strong incentive of engaging in disaster risk management. Indeed, it has been hypothesised that the pricing aspect of disaster risk insurance could give countries the tools to move from responding to events to managing risk since it may help governments, businesses, and households to plan in advance of a disaster and to agree on rules and processes for securing funds through their budget and for

[86] This view seems to lack scientific backing, cf. OCHA, Policy Development and Studies Branch (PDSB), 'OCHA and Slow-Onset Emergencies', *OCHA Occasional Policy Briefing Series*, Brief No. 6 (2011), p. 10.
[87] See, for example, R. Cervigni and M.L. Morris (eds.), *Confronting Drought in Africa's Drylands: Opportunities for Enhancing Resilience* (Washington, D.C.: World Bank, Agence Francaise de Development, 2016), p. 174.
[88] Clarke and Hill, 'Cost-benefit analysis of the African risk capacity facility'.
[89] Ibid., at 38.

spending this money prior to the disaster striking.[90] However, the resiliency benefits of sovereign disaster insurance is strongly linked to preparedness planning.

The on-going climate changes mean that we may expect 'natural' hazards caused by droughts, hurricanes, and changed precipitation to become still more frequent within the foreseeable future. This development will necessarily have to be reflected in the premiums to be paid under the Global South risk pooling schemes. If it turns out that these climate changes make livelihoods in certain parts of the member countries of Global South risk pooling schemes unsustainable,[91] this is likely to be reflected in the insurance policy – either through increased premiums or more limited coverage.[92] The crucial point to make is that risk pooling is a useful tool for building resilience, but there are important limits to what can be achieved through risk pooling. In particular, if livelihoods in an area become unsustainable, this will be reflected in the insurance coverage.[93] Of course, a member country may choose to take out coverage regarding such an area, but it is probably more likely that the country will discontinue the insurance coverage. This will, however, signal to the population in the area that they are 'on their own' – which in itself may create political challenges.[94]

5. FINDINGS

Even though the three existing Global South risk pooling schemes are all very young, we believe that much can be learned from them. However, before we outline the pros and cons of the schemes, it is important to point out that there are major differences between them. In particular, on the one hand, the CCRIF and PCRAFI primarily cover small, vulnerable island states whereas ARC provides cover to much larger states (many of which are landlocked). Moreover, both CCRIF and PCRAFI primarily focus upon infrastructure whereas ARC focuses upon farming (i.e. urban versus rural areas). Additionally, CCRIF and PCRAFI are more akin to traditional insurance schemes than is ARC. In particular, ARC requires the member countries to draw up contingency plans and the ARC member countries are not free to use the insurance pay-outs as they like, but rather must use them towards the areas that have been affected by the hazard.

Bearing these differences in mind, in this chapter we have found that, on the one hand, carefully designed Global South risk pools constitute a valuable tool to build resilience against hazards in vulnerable societies. On the other hand, it is equally clear that it is a tool which only addresses infrequent, devastating events, and the insurance coverage only finances the first (limited) response. In other words, the majority of the challenges posed by hazards such as droughts must be addressed through other tools.

We have also seen that a number of traditional donors such as the World Bank have played key roles in the creation of the three existing Global South risk pooling schemes. Indeed, we find that there are strong arguments in favour of donors encouraging and financially supporting the

[90] World Bank, *Sovereign Climate and Disaster Risk Pooling*, p. 26.
[91] For example, because extreme hurricanes become very frequent.
[92] Climate change in itself poses a challenge to risk pooling: Risk is priced based on the historical record. An uncertain historical record – or one that will not match future events due to climate change – will lead to higher prices because of market uncertainty. In their current form risk pools are not equipped to deal with this. We therefore need other mechanisms that can respond to increased volatility to make the current risk pooling system effective.
[93] The premiums for natural hazard insurance coverage is merely a rather rough proxy for the actual costs of resilience interventions. On the latter, see for example Cervigni and Morris, *Confronting Drought in Africa's Drylands*, p. 214f.
[94] Whereas discontinuing taking out insurance coverage is, first of all, a political decision, it would seem tempting for a member country to blame the risk pooling scheme for introducing prohibitive amendments to the insurance policy.

use of such schemes rather than 'merely' providing traditional post-hazard assistance.[95] In addition to providing early recovery funding, the schemes also provide the following four advantages:

First, the schemes are not only about post-disaster compensation, but also about increasing societal resilience, including in the case of ARC requiring member countries to draw up pre-disaster contingency plans.

Second, putting a price tag (a premium) on the risks of hazards allows the member countries' administrations to consider the best way of addressing these risks (cost-benefit). For example, it may be more attractive to require new buildings to be better able to withstand hurricanes (despite the additional construction costs this will entail) than to merely rely on insurance coverage.

Third, when it comes to climate change the 2015 Paris Agreement in article 8(1) and (4(f)) point to risk pooling schemes like the ones we have examined in this chapter as a way of attaining the Agreement's 'loss and damage objectives'. The Agreement's support to the creation of risk pooling schemes in itself makes it natural for Western donors to provide financing to the establishment of this type of schemes.

Fourth, the schemes allow for early intervention thereby limiting human suffering that may accompany a slow intervention.

However, the risk pools examined in this chapter are not without their drawbacks.

First, as illustrated by the cases relating to Malawi and to the Solomon Islands, a poor drafting of an insurance policy may turn out to be disastrous. It is therefore decisive that each policy is very carefully drafted; and that the parametric schemes are continuously improved.

Second, poor nations may lack the financial capacity to pay for an insurance premium and may lack the operational capacity to apply a contingency plan following a significant disaster. This means that, unless premium subsidies are available from donors, some of the most vulnerable countries that are most at risk from climate hazards may be unable to afford the coverage they need.

Third, although an insurance pay-out can have the effect of signalling to other humanitarian actors that there is a crisis and quantifying the potential response costs, countries that have taken out insurance coverage may also find that traditional humanitarian aid donors are hesitant to contribute, believing that the insurance coverage eliminates or reduces the need for a full humanitarian intervention.

Fourth, risk pricing is based on modelled losses. This is done probabilistically and includes a large number of data sets and a variety of statistical methods, among which, historical records are an important input. To the extent that climate change makes hazards not only more frequent and severe, but also harder to predict, this will mean that it becomes increasingly difficult to price such risks and prices may increase to the point where they become unaffordable.

Fifth, from an institutional point of view, it is important to be aware that insurance pay-outs may be administered by agencies with humanitarian rather than developmental functions. This has potential implications for the longer-term desired risk management effects, particularly if governments do not integrate their insurance tools into their overall national disaster risk planning and development objectives.

[95] For a somewhat more hesitant view on using development (or humanitarian) aid to support risk pooling schemes, see J. Linnerooth-Bayer, R.R. Mechler, and S. Hochrainer-Stigler, 'Insurance Against Losses From Natural Disasters in Developing Countries', *Journal of Integrated Disaster Risk Management*, 1 (2009) 1, 59–81.